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fact sheet

Lead and Copper Rule

Lead Service Line Replacement Requirements

Lead service line replacement is required under the following circumstances:

- 1. Your 90th percentile lead level exceeds the lead action level in any monitoring period conducted after you install corrosion control treatment; *or*
- 2. MassDEP requires it because you have missed your deadline for installing corrosion control treatment or source water treatment.

If you are required by MassDEP to initiate lead service line replacement, you must submit a Lead Service Line Replacement Program (LSLRP) to the MassDEP Drinking Water Program for approval prior to initiating the LSLRP. This critical step will ensure that your program is in compliance with all federal and state requirements. Please include the following elements in your LSLRP.

- You are not required to replace an individual lead service line if the lead concentration of all samples from the line is less than or equal to 0.015 mg/L. This line counts as a replaced line.
- If you do not replace the privately owned portion of a lead service line (also known as partial lead service line replacement), you must collect a sample that is representative of the water in the service line within 72 hours of the replacement.
- There are 3 methods for collecting a lead service line sample: 1) Flushing a specified volume; 2) Direct service line samples; and 3) Using temperature variation.
- You can discontinue lead service line replacement, and thus any need to conduct lead service line monitoring, whenever your 90th percentile lead level is at or below the lead action level for 2, consecutive monitoring periods.
- You must recommence lead service line replacement if you subsequently exceed the lead action.

When must a system replace lead service lines?

You must begin replacing lead service lines if you continue to exceed the lead action level after installing corrosion control treatment and/or source water treatment (in whichever sampling occurs later). MassDEP can also require you to begin lead service line replacement if you are required to install corrosion control treatment or source water treatment and have not installed such treatment.

What are the reasons for collecting lead service line samples?

To determine if a lead service line must be replaced. You are not required to replace an individual lead service line if the lead concentration of all samples from the line is less than or equal to 0.015 mg/L. This line counts as a replaced line. You are required to replace a minimum of 7 percent of your lead service lines annually for as long as you continue to exceed the lead action level. *This monitoring is optional, but it may save you the expense of replacing a lead service line.*

To determine the impact of partial lead service line replacement on lead levels. Partial lead service line replacement occurs when you do not replace the privately owned portion of the line, because of legal restrictions or the owner decides not to pay for the replacement of the privately owned portion. In this event, you must collect a sample that is representative of the water in the service line that you partially replaced and have the sample analyzed for lead within 72 hours after the partial lead service line replacement. *This monitoring is required*.

Which Systems Must Collect Lead Service Line Samples?

Only those systems that are required to replace lead service lines may be required to conduct some lead service line monitoring. *As stated above, monitoring to determine whether a line needs to be replaced is optional.* However, the cost of a lead analysis is less expensive than the cost to replace a line.

If you replace a line, but do not replace the privately owned portion of the line, then you must collect a sample that is representative of the water in the service line. This sample is not required if you replace the entire lead service line, or if you only replaces a gooseneck, pigtail, or other fittings and these are the only lead components in your service line.

When Do I Collect Lead Service Line Samples?

The first required year of lead service line replacement begins on the date you exceed the lead action level in tap samples collected after installing corrosion control or source water treatment, whichever is later, or as specified by the State.

You are required to replace at least 7 percent (or more if required by the State) of the initial number of lead service lines in your distribution system. The initial number of lead service lines is the number in place at the time the replacement program began. You must continue replacing the required percentage of lead service lines each year until you no longer exceed the lead action level during 2 consecutive monitoring periods of any duration

How Do I Collect Lead Service Line Samples?

You can collect these samples using one of the following procedures. For each method, collect a 1-liter sample from the tap by filling the sample bottle to the 1-liter mark, then cap immediately.

- Flushing a Specified Volume The sample should be collected from the building tap which is closest to the portion of the lead service line that was not replaced (i.e., the first tap in the building, most likely a kitchen or bathroom tap on the first floor). Flush the estimated volume of water between the service connection and the sample tap. You can estimate the volume of water by using the Table below, Pipe Volume Table. EPA recommends selecting the pipe diameter that is one size larger than the actual pipe size, since pipe material thickness can vary, affecting the interior diameter and the actual volume of water. You can also estimate the volume by measuring the length and diameter of piping from tap to connection and the length and diameter of the service connection itself into a graduated beaker or cylinder to ensure that you have collected the correct volume, then, close the tap.
- Direct Service Line Samples In communities where the meters are located outside the buildings (or in unmetered areas) service line taps may already exist. Prior to sampling, water should be run to flush the pipe that connects the faucet and the service line. If no tap exists, but the lead service line can be made accessible, a tap constructed of lead-free materials can be installed directly into the line for sample collection purposes. However, because installation of a tap directly into the lead service line could induce additional corrosion activity and is an expensive process as well, this option is not recommended when there are no existing service line taps.
- Temperature Variation This method is recommended if the temperatures of lead service line and interior piping are easily distinguishable (for example in a single-family home). A tap sample should be collected by gently opening the tap and running the water at a normal flow rate, keeping a hand or finger under the flowing water. When a change in water temperature is detected, a 1-liter sample should be collected by filling the sample bottle to the appropriate level and capping.

Pipe Volume Table (Volumes Listed in Liters)						
Pipe Length (Feet)	Pipe Diameter (Inches)					
	3/8	1/2	5/8	3/4	1	11/4
2	0.06	0.09	0.14	0.19	0.32	0.50
3	0.09	0.14	0.21	0.29	0.49	0.74
4	0.11	0.18	0.27	0.38	0.65	0.99
5	0.14	0.23	0.34	0.48	0.81	1.24
6	0.17	0.27	0.41	0.57	0.97	1.48
7	0.20	0.32	0.48	0.67	1.14	1.73
8	0.23	0.36	0.55	0.76	1.30	1.98
9	0.26	0.41	0.62	0.86	1.46	2.22
10	0.28	0.45	0.69	0.95	1.62	2.47
11	0.31	0.50	0.75	1.05	1.78	2.72
12	0.34	0.55	0.82	1.14	1.95	2.96
13	0.37	0.59	0.89	1.24	2.11	3.21
14	0.40	0.64	0.96	1.33	2.26	3.46
15	0.43	0.68	1.03	1.43	2.43	3.71
16	0.46	0.73	1.10	1.52	2.60	3.95
17	0.49	0.78	1.16	1.62	2.76	4.20
18	0.51	0.82	1.23	1.71	2.92	4.45
19	0.54	0.86	1.30	1.81	3.08	4.70
20	0.57	0.91	1.37	1.90	3.24	4.94
25	0.71	1.14	1.71	2.38	4.06	6.18
30	0.86	1.36	2.06	2.85	4.87	7.41
35	1.00	1.59	2.40	3.33	5.68	8.65
40	1.14	1.82	2.74	3.80	6.49	9.88
60	1.43	2.27	3.43	4.76	8.11	12.36

Volumes can be added together for pipe lengths not listed.
 Liters can be converted to gallons by dividing by 3.785.
 EPA recommends selecting the pipe diameter that is one size larger than the actual pipe size, since pipe material thickness can vary, affecting the interior diameter and the actual volume of water.

What is required in a Lead Service Line (LSLR) program?

The Lead and Copper Rule requires that a lead service replacement program have the following elements. For consistency and to ease implementation, MassDEP has created a number of draft documents that you can customize for your own community. Visit http://www.mass.gov/dep/water/approvals/dwsforms.htm#lead.

1. Survey and summary of your distribution system

Communities must replace 7% of the initial number of lead service lines annually. The initial number of lead services is the number in place at the beginning of the lead service replacement program. You must determine from your local records how many lead services are currently in place as of the date your system failed the action level. To assist you in developing a summary of your distribution material see "Identifying Sites for Lead and Copper Sampling and Preparing a Sampling Plan and Materials Survey" on the above noted web page.

If your records do not enable you to make an accurate determination of the number of lead services immediately, you should conservatively estimate the number based on information such as the age of housing stock, pipeline rehabilitation program records and other sources. For example, you could determine that your system began to use copper services in 1940, and thus any home built prior to that date probably originally had a lead service. Take that number, subtract from it any known lead service replacements, and the remainder is a conservative estimate of how many lead services there may still be in your community. Of course, this will probably lead to your being required to do more replacements in the first year. The LSRP should then also include a process for more accurately determining the number based on other research and field work or the results the lead service replacement work during the first year.

2. Action Plan

Communities are only obligated to replace the portion of the lead service they own or control although the *Department strongly recommends that it develop programs to assist homeowner to expedite entire lead service line replacement.*Typically water systems own or control from the main to the property line, back of curb line or curb stop. The regulations require that you provide some documentation and support from "relevant legal authorities (e.g. contracts, local ordinances) regarding the portion owned by the system." This is particularly important if your community differs from the typical situation. DEP will only require documentation if you are claiming that you own or control less than the portion from the main to the property line.

3. Home owner notification, education and replacement offer

If you do not own or control the portion of the service line on private property, and are not directly replacing it at the community's expense, *the system must offer to replace the homeowner's portion at the homeowner's expense*. This notification must occur at least 45 days prior to the work commencing. You must be able to document that you have notified each and every affected homeowner. Visit the above noted page for examples for a first and second notice to each homeowner,

and a template for tracking the various required back and forth contacts with the homeowner. You should also make a lead education fact sheet available to enclose with the notices. A copy of a fact sheet is available at the above noted web page.

The notification to homeowners must explain that *they may experience a temporary increase in lead levels in their drinking water if they do not replace their portion of the service line*. You must also provide them with information on measures they can take to minimize that exposure.

Given that lead exposures may increase if only a portion of the service line is replaced, it is important that you make every effort to convince the homeowner to replace their portion.

Other examples of Lead Service Line Replacement programs

- Some water systems replace both their portion and the homeowners at the
 water systems expense. This is in some ways simpler and involves
 substantially less paperwork and mandatory interaction with the
 homeowner, but may involve dealing with restoration of landscaping in
 some cases.
- Some water systems have established betterment funds, with the initial
 expense of the homeowner's portion being covered by the water system,
 and paid off by the homeowner over a number of years, at either normal
 interest rates or at a reduced rate.

4. Partial lead service line replacement program including sampling and notification

If you chose to replace part of a lead service line you must also collect a lead sample from each partially replaced service line within 72 hours of the work. You must provide the results to the homeowner within 3 days of receiving them. This should be tracked and documented as well. The date you collect the sample, the date you receive the results and the date you send the results to the homeowner should be recorded on the tracking sheet along with the lead results. See sample letters on the above noted web page.

If a homeowner does not respond to the notices or does not replace their portion of the lead service line, MassDEP strongly recommends that the homeowner be referred to the local Board of Health for additional educational information on lead health effects.

The 'partial replacement' sample is NOT the usual first flush kitchen tap sample! The sample must be taken of water that has sat stagnant in the lead service for at least 6 and no more than 12 hours. The regulations require that this be taken by calculating the volume of water in pipes leading from the service to the sample tap used, by tapping directly into the service line, or in a single family home by running the water until there is a significant change in temperature indicating that the service has been reached. These are difficult samples to collect properly, and you should carefully consider how you or your contractor will accomplish this requirement. If you replace the entire service, you do not have to take this sample.

This issue has influenced some communities elsewhere in the country to decide to do entire lead service replacements themselves.

5. Annual Report

At the end of the year you will need to prepare and submit a Lead Service Line Replacement Report to DEP demonstrating completion of the required 7 % lead service replacements, and compliance with the various notice requirements. The report should include:

- Summary Table completely filled out.
- Lead results of homes with **partial** lead service line replacement.
- Copies of the master letters for first and second notices, along with any other information materials provided to homeowners.

6. Records

You should retain for your records, copies of all notices sent and returned by homeowners, and contractors' records of the work completed.

Content and format of your Lead Service Replacement Program submission:

Your initial plan submission must be responsive to each of the requirements of the Lead and Copper Rule listed above and at a minimum, includes the following informational sections noted below. In addition, it should contain information about sources of funding, anticipated schedules, who will manage the program, and plans for updating or confirming any data, which you are not fully confident about. You may also want to include information about how you will deal with any lead services replaced in the process of doing pipeline repair work. These can count toward the 7 percent requirements, but do not need to follow precisely all the notification steps.

- Plan Overview and Summary
- Identification of Existing Lead Services
- (Plan for Confirming Number, if unsure)
- Funding Sources
- Anticipated Schedules
- Notification Plan and Tracking Forms
- Water Quality Testing Process

Available Resources:

See http://www.mass.gov/dep/water/approvals/dwsforms.htm#lead for all forms noted in this document.